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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/534,738	05/12/2005	Raymond John Brooks	101806.56312US	9062

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EXAMINER
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DUONG, DIEU HIEN

ART UNIT	PAPER NUMBER
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2821

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/534,738	<b>Applicant(s)</b> BROOKS ET AL.	
	<b>Examiner</b> DIEU HIEN T. DUONG	<b>Art Unit</b> 2821	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 03 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 14 October 2008.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1,5,6,10-18,20,21,24,26 and 27 is/are pending in the application.
- 4a) Of the above claim(s) 15,16,19 and 24 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,5-6,10-14,17-18,20-21,26-27 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 October 2008 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

### **DETAILED ACTION**

1. This office action is a response to applicant's amendment filed 10/14/2008. In virtue of this amendment, claims 2-4, 7-9, 22-23 and 25 are canceled; claims 26-27 are newly added.

According to the Office Action mailed 07/14/2008, claims 15-16, 19 and 24 are withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b).

Therefore, claims 1, 5-6, 10-14, 17-18, 20-21 and 26-27 are currently in the instant application.

### ***Drawings***

2. The drawings filed 10/14/2008 are acknowledged.

### ***Claim Objections***

3. Claim 1 is objected to because of the following informalities:

Claim 1, line 13, "it" should be changed to - -said dog-leg portion- -;

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 10 and 17-18 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 10, lines 2-4, the recitation “wherein the support arm is sufficiently long to carry an antenna reflector of approximately 3.5 metres diameter with an associated focal length of approximately 7 metres” is unclear. It is not clear that the “antenna reflector of claim 10 is the same or different with the “antenna reflector” of claim 1. If they are the same, it should be changed to “the antenna reflector”. If they are different, it should be changed to “a second antenna reflector”.

Regarding claim 11, lines 2-5, the recitation “wherein the hinged joints are bolted using metal brackets with a degree of flexibility to accommodate for change in material properties of the boom in response to temperature variations between +140° C to -180° C” is unclear. It is not clear what the term “degree of flexibility” in the phrase “the hinged joints are bolted using metal brackets with a degree of flexibility” refers to and how the hinged joints are bolted using metal brackets with a degree of flexibility to accommodate for change in material properties of the boom.

Regarding claim 17, lines 1-4, the recitation “a spacecraft incorporating into at least one side thereof a hinged support structure including an antenna reflector with a boom as defined in claim 1” is unclear. It is not clear for the reasons set forth below:

a) The “spacecraft” of claim 10 is the same or different with the “spacecraft” of claim 1. If they are the same, it should be changed to “the spacecraft”. If they are different, it should be changed to “a second spacecraft”.

b) What is the difference between the “support arm” of claim 1 and “hinged support structure” of claim 17?

Art Unit: 2821

c) It is not clear how the spacecraft incorporating into at least one side thereof a hinged support structure?

Regarding claim 18, line 3, there is insufficient antecedent basis for the limitation “the space vehicle” in the claim.

Clarifications are required.

***Claim Rejections - 35 USC § 102***

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 1, 5-6, 12-14, 17-18, 20-21 and 26-27 are rejected under 35 U.S.C. 102(b) as being anticipated by Baghdasarian et al. (US 6,424,314 B1 cited by applicant), hereinafter “Baghdasarian”.

Regarding claim 1, Baghdasarian discloses, in Figures 2-6, an articulated boom for a space based antenna reflector system having

an antenna reflector (10) supported on said boom; wherein said boom comprises a support arm (18) having a plurality of hingedly connected hinged joints (30, 31); said support arm (18) is adapted and arranged to carry the antenna reflector (10) so that in use, the antenna reflector (10) can move between a first stowed position in which the reflector is nested within a predetermined volume of a spacecraft; and a second deployed position in which the reflector is deployed in space outside said predetermined volume; said support arm (18) includes a dog-leg portion that permits stowage of said

Art Unit: 2821

antenna reflector (10) said stowed position; and said dog-leg portion is configured and positioned such that it extends at least partially along a circumference of the antenna reflector (10) when said antenna reflector is in said stowed position.

Regarding claims 5-6, as applied to claim 1, Baghdasarian discloses, in Figures 2-6 and col. 3, lines 28-42, wherein at least one of said hinged joints comprises an articulated stepper motor harmonic drive unit; wherein at least one of said hinged joints comprises a spring-operated mechanism hinge.

Regarding claim 12, as applied to claim 1, Baghdasarian discloses, in Figures 2-6, wherein one end of the support arm (18) is mounted to an associated feed structure of the spacecraft; and the opposing end of the support arm is mounted to the antenna reflector (10).

Regarding claims 13-14, as best understood, as applied to claim 12, Baghdasarian discloses, in Figures 2-6, wherein in stowed position, the antenna reflector (10) is foldably mounted to a sidewall of the spacecraft on a plurality of hold-down points; and said hold-down points are operably released prior to deployment of the reflector; wherein said hold-down points are formed such that to provide a degree of compliance, such that the boom and the spacecraft do not impart unwanted thermal expansion loads on each other.

Regarding claims 17-18, as best understood, as applied to claim 1, Baghdasarian discloses, in Figures 2-6, a spacecraft incorporating into at least one side thereof a hinged support structure (18) including an antenna reflector (10) with a boom as defined in claim 1; wherein the spacecraft as claimed in claim 17, wherein an

Art Unit: 2821

associated feed structure (15, 16) is mounted to a separated-formed floor of the space vehicle.

Regarding claim 20, Baghdasarian discloses, in Figures 2-6, a reflector system for space-based applications incorporating an antenna reflector (10) with supporting boom as defined in claim 1.

Regarding claim 21, Baghdasarian discloses, in Figures 2-6, an antenna structure incorporating a reflector system as defined in claim 20.

Regarding claims 26-27, Baghdasarian discloses, in Figures 2-6, wherein, in said stowed position, said dog-leg portion (18) lies within a first plane that is substantially parallel to a second plane defined by said antenna reflector (10); wherein the dog-leg portion (18) is coupled to the spacecraft by a hinged joint that provides for pivotal rotation of said dog-leg portion about a pivot axis; and said pivotal axis is substantially parallel to said first plane.

### ***Claim Rejections - 35 USC § 103***

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Baghdasarian et al. (US 6,424,314 B1), hereinafter "Baghdasarian".

Regarding claim 10, Baghdasarian discloses, in figures 2-6, the support arm (18) being sufficiently long to carry an antenna reflector (10).

Baghdasarian does not disclose the antenna reflector of approximately 3.5 metres diameter with an associated focal length of approximately 7 metres.

However, such difference is not of patentable merits since it would have been obvious to one having ordinary skill in the art at the time the invention was made to determine the size of the reflector based on a particular application or environment of use. Therefore, to employ having the antenna reflector of approximately 3.5 metres diameter with an associated focal length of approximately 7 metres would have been deemed obvious to person skill in the art of antenna.

10. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Baghdasarian et al. (US 6,424,314 B1), hereinafter "Baghdasarian '314" in view of Baghdasarian et al. (US 5,673, 459 cited by applicant), hereinafter "Baghdasarian '459".

Regarding claim 11, as best understood, Baghdasarian '314 discloses every feature of claimed invention, except for wherein the hinged joints are bolted using metal brackets with a degree of flexibility to accommodate for changes in material properties of the boom in response to temperature variations between +140° C to -180° C.

Baghdasarian '459 discloses, in col. 6, lines 47-54, wherein the hinged joints are bolted using metal brackets with a degree of flexibility to accommodate for changes in material properties of the boom in response to temperature variations between +140° C to -180° C.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to include the metal bracket of "Baghdasarian '459 in the antenna



Art Unit: 2821

reflector system of "Baghdasarian '314 to achieve the claimed invention, doing so would achieve an inexpensive antenna reflector system (col. 2, line 65 to co. 3, line 1).

### ***Response to Arguments***

11. Applicant's arguments with respect to claims 1, 5-6, 10-14, 17-18, 20-21 have been considered but are moot in view of the new ground(s) of rejection.

### ***Conclusion***

12. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

### ***Inquiry***

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to DIEU HIEN T. DUONG whose telephone number is

Art Unit: 2821

(571)272-8980. The examiner can normally be reached on Monday - Friday, from 8:30AM-5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Douglas W. Owens can be reached on 571-272-1662. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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/Trinh Vo Dinh/

Primary Examiner, Art Unit 2821